

CLAIMS

1. An optical plastic fiber comprising a core region and having a center line along a longitudinal axis of the fiber, in any plane perpendicular to the center line, a refractive index of the core region increasing along a direction going from a periphery portion to the center line, and

in any plane parallel to the center line and containing the center line, a birefringence index varying along a direction going from the center line to a periphery portion perpendicular to the center line.

2. The optical plastic fiber of claim 1, wherein the core region is formed of a material having a positive intrinsic birefringence; and in any plane parallel to a propagating direction and containing the center line, an absolute value of a birefringence index Δn , $\Delta n = n_x - n_y > 0$, where n_x is a refractive index parallel to the longitudinal axis and n_y is a refractive index perpendicular to the longitudinal axis, increases along a direction going from the center line to a periphery portion perpendicular to the center line.

3. The optical plastic fiber of claim 1, wherein the core region is formed of a material having a negative intrinsic birefringence; and in any plane parallel to a propagating direction and containing the center line, an absolute value of a birefringence index Δn , $\Delta n = n_x - n_y < 0$, where n_x is a refractive index parallel to the longitudinal axis and n_y is a refractive index perpendicular to the longitudinal axis, decreases along

a direction going from the center line to a periphery portion perpendicular to the center line.

4. The optical plastic fiber of any one of claims 1 to 3, wherein the core region is formed of a uniform composition.

5. The optical plastic portion of any one of claims 1 to 4, wherein molecules in the core region are aligned along the longitudinal axis and a degree of the alignment varies along a direction going from the center line to a periphery portion perpendicular to the center line.

6. A process for producing an optical plastic fiber comprising drawing a preform comprising at least one region formed of a material having an intrinsic birefringence into fiber while passing the preform through at least two zones where a temperature is set to be different each other, thereby creating a temperature-difference of 5 °C or larger between a center portion and a periphery portion of the preform before the preform is drawn into fiber.